

The equation for free fall at the surface of Mars is $s = 1.86t^2$ m where t = seconds. Assume a rock is dropped from a 200-m cliff.

(a) Find the average speed over the interval $[2, 4]$
slope of secant

(b) Find the instantaneous speed at $t = 1$ sec.

$$\textcircled{a} \quad m = \frac{f(4) - f(2)}{4 - 2} = \frac{29.76 - 7.44}{2} = 11.16 \text{ m/s}$$

$$\textcircled{b} \quad \frac{f(1.0001) - f(1)}{1.0001 - 1} = 3.720186$$

$$\lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h} \Rightarrow \frac{1.86(1+h)^2 - 1.86(1)^2}{h}$$

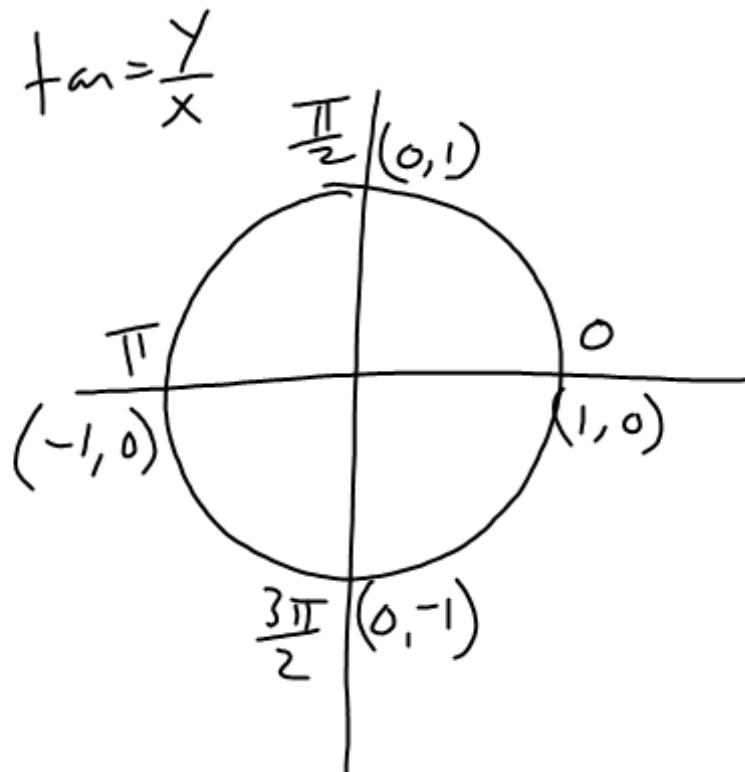
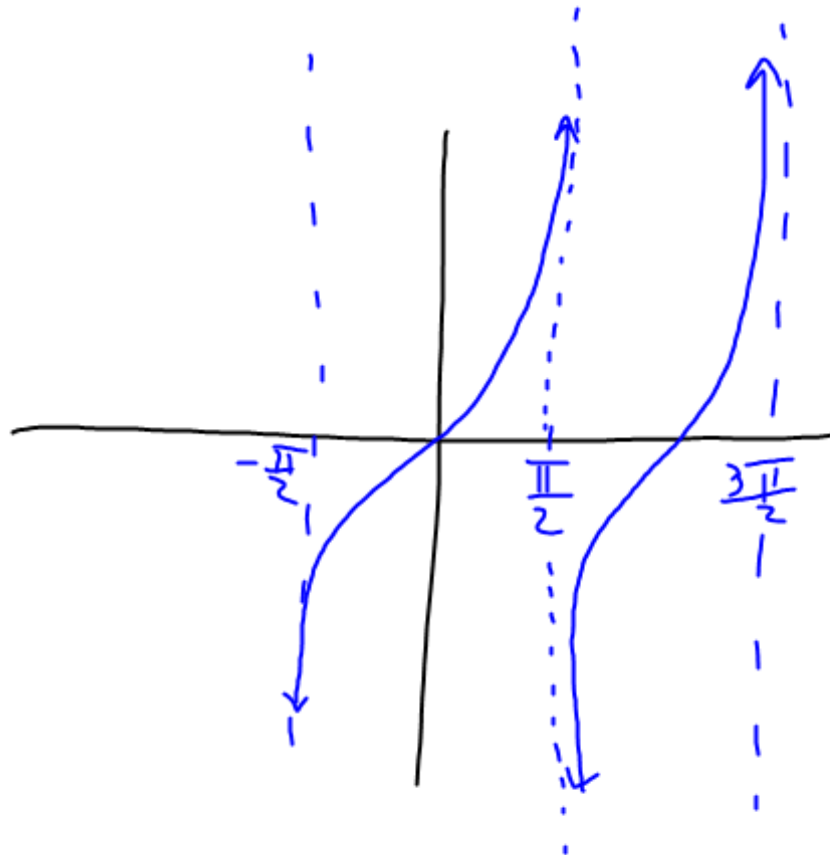
$$\frac{1.86(1+2h+h^2) - 1.86}{h}$$

$$\frac{\cancel{1.86} + 3.72h + 1.86h^2 - \cancel{1.86}}{h}$$

$$\lim_{h \rightarrow 0} \frac{3.72 + 1.86h}{1} = 3.72 \text{ m/s}$$

$$36\pi \text{ in}^3/\text{in}$$

$$113.0973 \text{ in}^3/\text{in}$$



$$\tan^{-1} \left(\frac{y}{x} \right) = \theta$$

HW

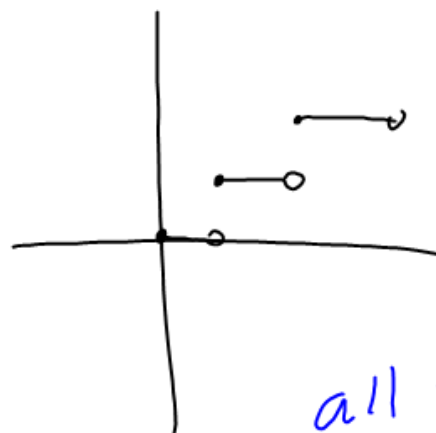
Sect. 2.4 #2, 3, 6, 7, 9, 10, 15, 17, 19, 20, 23, 25,

28, 29, 33, Quick Quiz 1-4

Test Thur
 $\frac{1}{2}$ calc
 $\frac{1}{2}$ no calcdiscontinuous at $x = \frac{\pi}{2} + k\pi$, k is an integer

$$|3-3|+1=1$$

$$\begin{array}{c}
 ax^2 + bx = 1 \\
 \uparrow \quad \uparrow \\
 3 \quad 3
 \end{array}$$



all values

$$9a + 3b = 1 \rightarrow b = \frac{1-9a}{3} \quad a = \frac{1-3b}{9}$$

$$\lim_{x \rightarrow 3} \frac{x^2 + 2x - 15}{x - 3} \Rightarrow \frac{(x-3)(x+5)}{x-3} \Rightarrow \lim_{x \rightarrow 3} (x+5) = 8$$

